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LIST OF PUBLICATIONS AND PATENTS
of the
Southern Regional Research Laboratory
2100 Robert E. Lee Boulevard
New Orleans 19, Louisiana

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CONTENTS

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ARTICLES AND ADDRESSES

No.

Apparatus, Analytical Methods, and Techniques

1 SEGAL, Leon, Creely, Joseph J., and Conrad, Carl M.

A ROTATING SPECIMEN MOUNT FOR USE WITH X-RAY SPECTROMETER IN MEASURING CRYSTALLITE ORIENTATION OF CELLULOSIC AND OTHER TEXTILE FIBERS. Rev. Sci. Instruments 21(5): 431-435. 1950.

The quantitative evaluation of crystallite orientation in textile fibers by x-ray methods is discussed. It is found that photographic recording and photometering of the resulting films can be replaced by automatic recording on a strip chart with the aid of an x-ray spectrometer with Geiger-Mueller counter. The design and details are given for a specimen holder capable of properly positioning and rotating a bundle of fibers in the x-ray beam so that the 002 or other selected diffraction arc passes before the window of the counter. A tentative procedure is outlined for evaluating, with the aid of this apparatus, the crystallite orientation of a bundle of cellulose fibers. Some typical recordings of the intensity curves of the 002 arcs from ramie, cotton, and high-tenacity rayon are presented.

2 STANSBURY, Mack F., and Hoffpauir, Carroll L.

DETECTION OF "HONEYDEW" ON RAW COTTON. AIC-262. (Processed.) 1950.

A reliable qualitative test for the presence of honeydew on cotton has been developed. Honeydew is the sticky carbohydrate-containing excreta of aphids resulting from the partial digestion of plant sap on which these insects feed. Its presence frequently makes cotton difficult to process. The test is based on the alpha-naphthol (Molisch) reaction, as applied to an aqueous extract of honeydew-contaminated portions of the cotton. A control test is carried out on clean, uncontaminated portions of the sample. Ultraviolet fluorescence is often helpful in distinguishing between clean and contaminated portions. In applications of the test to several honeydew-contaminated cotton samples, the samples which gave the strongest tests contained the greatest amounts of reducing sugars, 0.48 and 0.40 percent. Samples which had been picked after exposure to rain had considerable mold on the honeydew areas and gave only slight tests for honeydew. They also contained much less reducing sugars, apparently because of both the leaching by rain and the mold growth.

No.

Cotton and Cotton Products

3 BURAS, Edmund M., Jr., Goldthwait, Charles F., and Kraemer, Rita M.

MEASUREMENT AND THEORY OF ABSORBENCY OF COTTON FABRICS. Textile Res. Jour. 20(4): 239-248. 1950.

A simple and rapid absorbency-measuring test for application to cotton fabrics, using apparatus which is easy to assemble, evaluates numerically the rate of absorption and the ultimate absorption, largely independently of apparatus characteristics. The separate evaluation of these independent factors and the elimination of timing procedures sets this test apart from those previously published. The method is readily adaptable to the investigation of many liquid-absorbent relationships. Applications of the test to the evaluation of absorbency of purified cotton fabrics have led to a plausible explanation of their absorption behavior as being largely due to the spaces within the fabric rather than to the absorption characteristics of the fiber itself.

4 GOLDTHWAIT, Charles F., Smith, Herbert O., and Roberts, Florence T.

SPECIAL DYEING OF COTTON ON THE SEED GIVES VISUAL EVIDENCE OF CHANGES DURING FIBER DEVELOPMENT. Textile Res. Jour. 20(2): 100-104. 1950.

A process of differential dyeing employed to distinguish between thick- and thin-walled cotton fibers has been used to show visually that the drying of normal cotton fibers for the first time -- as when the boll opens in the field -- greatly affects their dyeing properties. The effect was observed as a pronounced color difference when one lock from a nearly mature boll, cut open in the laboratory, was dried and another lock was kept wet, and both were dyed in the same dye bath at the same time. The dried cotton dyed mainly red and the undried dyed green. The change in the cotton cellulose which caused the difference is undoubtedly submicroscopic, and takes place in addition to the changes visible in the microscope which are familiar in fibers that have dried normally on the plant. A significant feature of the submicroscopic change can be inferred from the dyeing behavior considered in relation to current views of the mechanism of direct dyeing -- that is, undried fibers from a cotton boll are shown by a new technique to be more porous than fibers which have dried in the boll, and the thin-walled fibers in ordinary cotton are similarly more porous than the thick-walled fibers at least while wet in a hot dye bath. It follows that the differential-dyeing effect with cotton fibers is determined by cellulose structure in combination with specific properties of the two dyes employed.

No.

5 KIME, James A.

RESEARCH IN THE COTTON INDUSTRY. Address, Meeting of the Southern Association of Science and Industry, January 23-24, 1950, New Orleans, Louisiana. South. Chem. 9(9): 344,346,348,350. 1950. [Condensed.]

Following introductory remarks on the impact of research and invention on the cotton industry, starting with the mechanical improvements of the eighteenth century, several developments at the Southern Laboratory in chemical and mechanical research on cotton are described. These include the differential dye test for immature fibers; a new draft guide used in the operation of high-draft roving frames for the production of better quality yarns; an insect-repellent treatment for flour and feed bags, developed in cooperation with the Bureau of Entomology; and a superior rot-, mildew-, and heat-resistant cotton produced by partial acetylation suitable for use in sandbags, fish nets, laundry press cloth covers, and other uses; and other examples of current cotton textile research. The particular research on cotton made possible by the funds provided under the Research and Marketing Act of 1946 is also reviewed.

6 NEWMAN, Seymour.

FLEXIBILITY OF NITROCELLULOSE MOLECULES IN ACETONE. [In Communications to the Editor.] Jour. Phys. and Colloid Chem. 54(6): 964-966. 1950.

The molecular parameters describing the hydrodynamic behavior of nitrocellulose in acetone are computed from published sedimentation-molecular weight data in accordance with the Kirkwood-Riseman theory; and are used to indicate the applicability of the theory, at least to a first approximation, for degrees of polymerization greater than 100.

7 REEVES, Richard E.

THE SHAPE OF PYRANOSIDE RINGS. Amer. Chem. Soc. Jour. 72(4): 1499-1506. 1950.

Consideration of 52 glycopyranosides from the point of view of ring shape in solution showed that pyranose rings assumed a chair form in preference to any boat form wherever both were structurally possible. Any substituent (other than hydrogen) oriented perpendicular to the pyranose ring introduced an element of instability into the conformation -- especially important were an erected oxygen on position 2 when its C-O valence bisected the two C-O valences of carbon atom 1 and a carbinol group at position 5 erected on the same side of the ring with a hydroxyl

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or substituted hydroxyl group. Conformational instability was observed for the methyl pyranosides of α-and β-altrose, α- and β- lyxose, and β-idose. These glycosides probably exist in solution in an equilibrium composed of appreciable amounts of both chair conformations. The formation of α(1,5) β(1,6) anhydrides in aqueous acid and the composition of the equilibrium solution of reducing sugars were related to the factors which influenced conformational stability. "Conformational instability factors" are listed for all of the D-aldohexoses and D-aldopentoses. Methyl β-D-altropyranoside and methyl 2-methyl-α-D-idopyranoside were prepared and characterized.

8 REEVES, Richard E., and Darby, Felix F., Jr.

STABILIZATION OF PERIODATE-OXIDIZED COTTON. Textile Res. Jour. 20(3): 172-174. 1950.

Earlier observations regarding the stabilization of periodate-oxidized cotton fiber by treatment with chlorous acid or ethereal diazomethane were confirmed and evaluation of the treatments was extended to a more complex system, cotton sewing thread. At low levels of oxidation the treated samples retained considerably more strength after exposure to sodium carbonate solution than did samples oxidized but not given a stabilization treatment. At high levels of oxidation the stabilizing treatments reduced alkali solubility pronouncedly.

9 SOUTHEASTERN Section, Intersectional Contest, American Association of Textile Chemists and Colorists

THE APPLICATION OF THE DIFFERENTIAL DYEING TEST FOR FIBER MATURITY TO THE PROCESSING OF COTTON. Amer. Dyestuff Rptr. 39(3): 74-77, 90. 1950.

The unique dye method for distinguishing mature and immature fibers has a number of applications during the processing of cottons. The technique has been used (1) to reveal partial maturity of fibers, "tippiness" (2) to select special cottons to illustrate that immature fibers cause inferior products and that selection of cotton by means of classer's designation of grade is not always adequate to insure efficient production and maximum quality; (3) to indicate that the spotting of cotton is not necessarily accompanied by excessive immaturity; (4) to help diagnose the source of difficulties with excessive neppiness encountered by a mill; (5) to indicate effectiveness of blending; (6) to check on the production of neps during processing and to indicate the nature of fibers in the waste; and (7) to establish the relationship of maturity by the dye test and fineness by the Micronaire. Each of these applications during the manufacture of cotton goods is discussed. Data are tabulated or plotted which show in each case the effectiveness of the dye test for fiber maturity. A brief description of the test procedure, fully described in a previous publication, is included.

No.

10 WARD, Kyle, Jr.

CRYSTALLINITY OF CELLULOSE AND ITS SIGNIFICANCE FOR THE FIBER PROPERTIES. Address, The Textile Symposium, American Chemical Society Meeting, September 1949, Atlantic City, New Jersey. Textile Res. Jour. 20(6): 363-372. 1950.

The subject is treated mainly from the standpoint of cotton cellulose. The concept of crystallinity is discussed not simply as the degree but also as the nature of crystallinity. With respect to the fine structure of cellulose there are four main factors, each involving a mean value and a distribution of values, both mathematical and spatial: (1) the nature of the crystal lattice, (2) the percentage of crystalline material, (3) the size of the crystallites, and (4) the orientation of the crystallites. It is possible to show the marked influence of some of these parameters on certain of the important physical properties of cotton. Decreased crystallinity and higher content of amorphous cellulose is symbatic with increased elongation, increased moisture regain, and increased chemical reactivity. Of particular interest in the last category is the special case of hydrolysis, a reaction in which it is possible that crystallization may occur. Data on the third parameter, the size of the crystallite, are too scanty to permit any conclusions to be drawn. The increase of fiber strength and of refractive index with improved orientation has been well established and is usually accompanied by a decrease in elongation.

Cottonseed, Peanuts, Rice, and Other Oilseeds

11 ANDRAOS*, Victor, Swift, C. E., and Dollear, F. G.

SESAME OIL. I. PROPERTIES OF A SOLVENT-EXTRACTED SESAME OIL. Amer. Oil Chem. Soc. Jour. 27(1): 31-34. 1950.

Data are presented on the extraction, processing characteristics, and the chemical and physical characteristics of oil obtained from white sesame seed. Extraction of sesame seed with hexane yielded a crude oil low in free fatty acids and light in color. The oil was refined with caustic soda under a variety of conditions with low losses and bleached with comparatively small quantities of several bleaching earths, each of which produced a light-colored oil. Sesame oil hydrogenated to shortening consistency exhibited extremely high stability when tested by the accelerated active oxygen method. This stability confirms previous suggestions that sesame oil contains one or more antioxidants of greater activity than those present in most of the other vegetable oils of commerce.

*Societe Nationale Industrielle, Beirut, Lebanon.

No.

12 DECOSSAS, Kenneth M., Mackey, Harvey A., and Heughan, Gordon P.

BOILING POINTS OF COTTONSEED AND PEANUT OIL MISCELLAS IN ENGLISH UNITS. AIC-257. (Processed.) 1950.

Data previously obtained on boiling point-vapor pressure-constant composition parameters for crude cottonseed oil-commercial hexane miscellas and crude peanut oil-commercial hexane miscellas have been replotted in English units; namely, in inches of mercury vacuum and in degrees of temperature Fahrenheit. Constant composition parameters are at 0, 50, 60, 70, 80, 85, 90, 93, 95, 97, and 98 percent oil by weight. The purpose of replotting is to render those data more useful and suitable for design calculations, plant operations, and interpretations of operating data.

13 FEUGE, R. O., and Gros, Audrey T.

MODIFICATION OF VEGETABLE OILS. IX. PURIFICATION OF TECHNICAL MONOGLYCERIDES. Amer. Oil Chem. Soc. Jour. 27(4): 117-122. 1950.

Experiments using technical monoglycerides prepared from cottonseed oil stearine by the conventional procedure were conducted to determine how readily the monoglycerides in the end products can be concentrated by processes adaptable to large-scale production. A number of the experiments were concerned with the removal of free glycerol, but the greatest effort was directed toward fractionation of the glycerides. Methods of fractional crystallization of glycerides from solvents were the most successful. For example, by changing only the type of solvent employed it was possible to change the monoglyceride content of the fatty portion in the filtrate from 10 to 92 percent. In the 92-percent concentration over 70 percent of the total monoglycerides in the system were found in the filtrate. At somewhat lower monoglyceride concentrations appreciably greater portions of the monoglyceride fraction were found in the filtrate.

14 HADDON*, R., Schwartz*, A. K., Williams*, P. A., Thurber, F. H., Karon, M. L., Dechary, Jos., Guice, W., Kupperman, R., O'Connor, Robt., and Altschul, Aaron M.

EFFECT OF PROCESSING CONDITIONS ON THE CHEMICAL PROPERTIES OF COTTONSEED MEALS. The Cotton Gin and Oil Mill Press. 52(9): 18-20. 1950.

As part of research on improving the nutritional value of cottenseed meal by means of improving the present methods of processing, the changes in chemical properties of cottonseed meals caused by variation in conditions of hydraulic- and screw-press operation were investigated. The processing experiments were conducted in a commercial mill on the effect of conditions of cooking the meats and of the degree of pressure

*South Texas Cotton Oil Company, Houston, Texas.

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exerted in the screw-press. Changes taking place in the cottonseed protein were measured by determination of nitrogen solubility. The disposition of gossypol and gossypol-like compounds was determined by measurement of content of free-gossypol-like materials in the meal. In screw-press operation it was possible to obtain meals whose analysis showed low gossypol contents with 40 percent of their nitrogen soluble in half molar salt solution. Collaborative feeding tests are under way for the purpose of correlating laboratory data on these properties with nutritive properties.

15 HUSSAIN*, S. A., and Dollear, F. G.

NOMOGRAPHS FOR CALCULATING THE FATTY ACID COMPOSITION OF OILS AND FATS FROM IODINE AND THIOCYANOGEN VALUES. Amer. Oil Chem. Soc. Jour. 27(6): 206-210. 1950.

Nomographs have been constructed for use in calculating the glyceride composition of oils and fats from iodine and thiocyanogen values and their application is described. Equations adopted by the American Oil Chemists' Society relating the glyceride composition with the iodine and thiocyanogen values of an oil were used for constructing the nomographs. The glyceride compositions of various oils calculated from the nomographs were in good agreement with those obtained by calculation from the equations.

16 JENSEN**, Edith A., Lambou, Madeline, G., and Altschul, A. M.

RESEARCH ON THE STORAGE OF COTTONSEED. The Cotton Gin and Oil Mill Press. 52(2): 11-12,31,34-35. 1950.

A number of mill-scale experiments have been conducted in cooperation with the cottonseed oil processing industry to test the soundness of conclusions based on laboratory experiments using chemical treatment, and to obtain accurate information on the exact nature of the cottonseed storage problem. A mill-scale storage experiment is being conducted on freshly harvested cottonseed of a moisture content of about 18 percent and a free fatty acids content of about 3.7 percent. Only tentative conclusions can be drawn. Heating was prevented by chemical treatment and free fatty acid formation was delayed for approximately 52 days. Some of the data being obtained indicate the effect of storage on the amount of total oil available in the seed. In other experiments, cottonseed was collected at intervals over a period of 2 months and the biological properties of the seed were investigated. The results emphasized that cottonseed is not a constant biological material. An experiment was performed to determine the relationship between microorganisms growing on the seed and the seed enzymes themselves in the

*State of Hyderabad, India.
**Fellow, National Cottonseed Products Association.

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development of free fatty acids. Results indicated that there are at least two types of free fatty acid development in moist cottonseed: one type is rapid and seems to be associated with a rapid rise in growth of micro-organisms; the other is gradual and takes place even in sterile seeds.

17 KARON, M. L., Adams, Mabelle E., and Altschul, A. M.

ELECTROPHORETIC ANALYSIS OF PEANUT AND COTTONSEED MEALS AND PROTEINS. Jour. Phys. and Colloid Chem. 54(1): 56-66. 1950.

Cottonseed and peanut meals and the derived proteins were analyzed by means of the Tiselius electrophoresis apparatus. The effect of (1) method of extraction of the protein and (2) of the buffer and pH of the buffer solutions was investigated. By fractional precipitation involving a change of ionic strength the two major components of cottonseed protein can be concentrated to over 80 percent purity. Approximately 75 percent of peanut protein consists of two components. These migrate as a single entity, unless the meal has been pre-washed to remove soluble sugars and phytin, in which case the two major components separate into two almost equal fractions.

18 MARKLEY, K. S.

SESAME -- A NEW OILSEED CROP FOR THE SOUTH. The Cotton Gin and Oil Mill Press 51(12): 10,12,60-61. 1950.

Sesame is one of the two oldest oilseed crops cultivated by man. In subtropical and tropical climates, on good land, and under proper conditions of cultivation, sesame yields approximately 800 pounds of seed per acre. The seed contains approximately 50 percent oil and 20 to 25 percent protein. It is free flowing and stores well for long periods even in tropical climates. It requires no decortication or preparation for milling other than cleaning. It is readily processed by conventional oil milling equipment.

The meal, which contains 50 to 55 percent protein, is a good stockfeed and is especially high in methionine.

The crude oil is very light in color; low in free fatty acids (generally, less than 2 percent even when produced from seed stored for a year or more); readily refined and bleached to a nearly water-white oil by conventional methods; and readily hydrogenated by conventional methods to yield a hardened fat of shortening consistency. The oil varies in stability at different stages of processing, but the stability is generally as high or higher than other soft or yellow oils. After

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hydrogenation to shortening consistency, it exhibits extremely high stability, for example, 560 to 840 AOM hours before deodorization and 380 to 544 AOM hours after deodorization. This variation at different stages of processing of the oil has been found to be correlated with its content of sesamol, a compound which is formed from sesamolin, another constituent of sesame oil. Sesamol is removed from the oil by alkali refining and deodorization and regenerated from sesamolin by bleaching with certain clays and carbons and by hydrogenation. Crude sesame oil also contains sesamin which, itself relatively inert chemically, acts as a powerful synergist in increasing the effectiveness of pyrethrin as an insecticide.

From the standpoint of ease of processing and utility as a food fat, sesame oil possesses many advantages in comparison with other common vegetable oils.

19 MENEZES*, F. G. T., Budowski,**Pierre, and Dollear, F. G.

SESAME OIL. II. SOME CHEMICAL AND PHYSICAL PROPERTIES OF THE OILS FROM DIFFERENT VARIETIES OF SESAME SEED. Amer. Oil Chem. Soc. Jour. 27(5): 184-186. 1950.

Seed from four varieties of sesame grown in South Carolina, Nebraska, and Nicaragua were extracted with commercial hexane in a pilot-plant batch extractor. The crude oils were alkali-refined, bleached, and deodorized, and samples were hydrogenated to shortening consistency (iodine value 68 to 70). The oils were examined with respect to their physical characteristics, fatty acid composition, and stability. Only slight variations were found in the physical constants and the composition of the oils from the different varieties. Outstanding were the comparatively low refining losses (1.5 to 4.7 percent, average 3.7 percent) and the light colors of the bleached oils (1 to 3 yellow, 0.4 to 0.7 red, Lovibond Scale). The changes in fatty acid composition during hydrogenation were notessentially different from those of other oils of similar composition. The stabilities of the crude oils varied widely, ranging from 4-1/2 to 33 hours (A.O.M., 97.7° C.). Alkali-refined oils had stabilities which ranged from 7 to 15 hours. Bleaching increased the stabilities to an extent depending on the oil and the type of bleaching earth used. One oil which was bleached with 3-percent "neutral clay" exhibited a stability of 39 hours, A.O.M. The same oils after hydrogenating to shortening consistency possessed stabilities in excess of 500 hours, A.O.M. A correlation was found to exist between stability and the free sesamol content of the oils.

*Trainee, Government of Madras, India.
**Rockefeller Foundation Fellow from the Ministerio de Agricultura y Cria, Division de Quimica, El Valle, D. F. Venezuela.

No.

20 MOLAISON, Henri J., Deckbar, Frederick A., and Cook, Norman C.

PILOT PLANT EQUIPMENT COSTS. Chem. Engin. 57(4): 110-111. 1950.

A survey of pilot-plant process equipment purchased over a 6-year period at the Southern Regional Research Laboratory is briefly reported. The survey covered only equipment of carbon steel construction that was designed by engineers of the Laboratory and for which detailed drawings were furnished to prospective bidders. The equipment was grouped into four general classifications and its cost was calculated in cost per pound. The averages and ranges of unit cost for the four general types of equipment are tabulated. A recommended procedure for using the data is included. It is hoped that the data will be useful not only to estimators in their purchase of designed pilot-plant equipment, but to those who are accumulating and correlating equipment cost information.

21 MORRIS, Nelle J., and Dollear, F. G.

ABSTRACT BIBLIOGRAPHY OF THE CHEMISTRY AND TECHNOLOGY OF PEANUTS, 1830-1939. AIC-151 (1949). (Processed.) 1950.

This bibliography is a compilation of more than 600 references, with abstracts, relating to the chemistry and technology of the peanut, Arachis hypogaea, and its derived products, including peanut butter, peanut oil, and peanut cake or meal. The references and abstracts are arranged alphabetically by author under the following headings: Peanuts, Peanut Cake, Peanut Oil, Peanut Shells and By-Products, and Miscellaneous. Subject and author indexes are provided. The sources of the references and abstracts are as follows: Chemisches Zentralblatt, 1830-1881; Journal of the Chemical Society, Abstracts, 1876-1910; and Chemical Abstracts, 1907-1939.

No.

22 POLLARD, E. F., Persell, R. M., Morrison, H. J., and Gastrock, E. A.

INSTRUMENTATION FOR PILOT PLANTS: OPERATION AND APPLICATION FUNDAMENTALS. Indus. and Engin. Chem. 42(4): 748-752. 1950.

Instrumentation fundamentals are presented as a guide to chemical engineers in the application of instrumentation in pilot plants. The elements of control systems and the control characteristics of processes are defined. The operation and application of simple control systems are illustrated and discussed. Several automatic controller actions in industrial use are described in detail. The terminology, definitions, and illustrations used are familiar to chemical engineers and will give them an initial orientation in this field.

23 REEVES, Wilson A., and Guthrie, John D.

ISOLATION OF XANTHINE, GUANINE, ADENINE, PROTEOSE, OXALIC ACID, AND GLUTATHIONE FROM PEANUT KERNELS. Arch. Biochem. 26(2): 316-318. 1950.

Xanthine, guanine, and adenine, a proteose, and oxalic acid were isolated from the supernatant liquid remaining after the precipitation of peanut protein. X-ray diffraction data were obtained for xanthine and for the gold chloride double salts of guanine and adenine. Glutathione was isolated from an alcoholic extract of peanut kernels. None of these substances have been previously isolated from peanut kernels.

24 REUTHER*, C. G., JR., Spadaro, J. J., and Gastrock, E. A.

RESEARCH ON FRACTIONATION OF COTTONSEED MEATS. The Cotton Gin and Oil Mill Press. 52(2): 12,35,39-40. 1950.

Progress in the development of a process of fractionation of cottonseed meats is reviewed, with emphasis upon the contribution of the fellow to these investigations. The fractionation process has been improved

*Fellow, National Cottonseed Products Association.

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to make possible increased yields of fine meal, essentially free of pigment glands. Feed flakes suitable for partial solvent extraction prior to fractionation have been produced and the quantities of products necessary for larger-scale evaluation have been made. In the fractionation process, either the defatted or undefatted flakes are disintegrated in a solvent slurry to detach the meal tissue from the pigment glands; the disintegrated solids are then separated either by the gravity flotation method or by the differential settling method; and the solids fractions then recovered from the oil-solvent mixtures (miscellas), which are, in turn, evaporated to recover the oil and solvents. Before the process can be considered for commercial adoption, feed flake preparation, disintegration and screening procedures, and product evaluation must be further investigated.

25 SINGLETON, W. S., Ward, T. L., and Dollear, F. G.

PHYSICAL PROPERTIES OF FATTY ACIDS. I. SOME DILATOMETRIC AND THERMAL PROPERTIES OF STEARIC ACID IN TWO POLYMORPHIC FORMS. Amer. Oil Chem. Soc. Jour. 27(4): 143-146. 1950.

The expansion of stearic acid in both solid and liquid states, its melting dilation, specific heat, heat of fusion, and entropy have been determined. The transition of the transparent, unstable B-form (long diffraction spacing) of stearic acid obtained by crystallization from benzene at room temperature, to the stable C-form (shorter diffraction spacing) occurred rapidly at 52.9° C. and at a slower rate at a considerably lower temperature (35.2°). Crystallization of stearic acid from hot glacial acetic acid yielded the stable modification, or C-form, and the unstable modification, or B-form, at room temperature. The temperature at which crystallization occurred also determined the crystalline form (B- or C-spacing) of stearic acid which was obtained from benzene solution. Crystallization at temperatures above the transition point produced only the C-form of acid, and below the transition point only the B-form of acid, irrespective of solvent used.

26 SWIFT, C. E., Fore, Sara P., and Dollear, F. G.

RICE BRAN OIL. V. THE STABILITY AND PROCESSING CHARACTERISTICS OF SOME RICE BRAN OILS. Amer. Oil Chem. Soc. Jour. 27(1): 14-16. 1950.

Nine batches of rice brans from different sources and different varieties of Southwestern-grown rice were extracted with hexane. Pilot-plant extraction of 5 batches of bran gave oils containing 13.8, 14.9, 17.0, 15.9, and 16.4 percent hexane-soluble lipids, equivalent to 90.5 to 92.6 percent of the total hexane-soluble lipids present in the brans. The corresponding crude oils containing 2.0 to 6.3 percent of free

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fatty acids were refined by the laboratory cup method with losses ranging from 12.0 to 23.5 percent. The neutral oil content of six of the crude oils ranged from 89.9 to 92.6 percent. The Lovibond color of all nine refined oils ranged from 35 yellow and 4.5 red to 70 yellow and 9.5 red. Bleaching with clay yielded oils ranging in color from 15 yellow and 15 red to 35 yellow and 3.2 Lovibond units. Bleached and deodorized oils had iodine values ranging from 101.3 to 105.7 and stabilities ranging from 20 to 29 hours, A.O.M. Bleached oils were hydrogenated to iodine values of 65.4 to 66.6 and deodorized. The stabilities of the deodorized hydrogenated products ranged from 225 to 460 hours and averaged 370 hours, A.O.M. The most outstanding characteristic of rice bran oil was its exceptional stability after hydrogenation.

27 WARD, T. L., Singleton, W. S., and Freeman, A. F.

HEAT CAPACITY OF STABILIZED PEANUT BUTTER. Food Res. 15(2): 146-149. 1950.

In an investigation of some of the physical properties of peanut butter, a calorimeter was modified for measuring the heat capacity of this product, and is described. It was found that the heat capacity of a sample of peanut butter which had been rapidly cooled after emerging from the grinding mill was 0.075 calories per gram higher than the same sample when slowly cooled, up to the final melting of the added hard fat which was present in the sample. Identical heat capacities were observed above 19° C., regardless of the rate of cooling of the sample. An equation was developed for expressing the heat capacity of peanut butter in the range 20° to 80°, which is $C_p = 0.361 + 0.0012\ t$.

Sweetpotatoes

28 PERSELL, R. M., Pollard, E. F., Guilbeau, W. F., Greathouse, L. H., Dawson, P. R., and Gastrock, E. A.

INSTRUMENTATION FOR PILOT PLANTS. pH CONTROL AIDS IN PRODUCTION OF SWEET POTATO STARCH. Indus. and Engin. Chem. 42(5): 931-932. 1950.

The application of instrumentation fundamentals in the development of a process concept into a practical working plan is illustrated by discussion of the pH control of the plant flow which eliminated certain major difficulties encountered in the pilot-plant development of an improved process for the production of sweet potato starch. Manual control by experienced operators made possible the continued operation of the process and gave a greater recovery of starch. A flowsheet of the process and a photograph of the pilot-plant instrument panel are given.

Miscellaneous

No.

29 KIME, James A.

THE ADVANCING UTILIZATION OF SOUTHERN FARM CROPS. Texas Agricultural Workers' Association, Proc., Twenty-Third Annual Meeting, January 13-14, 1950, Galveston, pp. 39-45. Also a modified version in Oil Mill Gazetteer 55(1): 25-27. 1950. [Natl. Oil Mill Superintendents Assoc., Proc.]

Emphasizing the effectiveness of cooperation between the Southern Regional Research Laboratory and other agricultural workers in coping with practical problems of mutual concern, the paper cites numerous instances of successful joint research, in Texas particularly. It is mentioned that the overall research program of the Southern Laboratory covers practically every step of processing which could be expected to improve the industrial utilization of cotton, cottonseed, sweet-potatoes, rice, peanuts, and other oilseeds. A few of the major cooperative achievements are reviewed and the development of a differential dye test is fully described. Cited also are modernization of the naval stores industry of the South, and the new test for detecting the presence of the enzymes that cause the spoilage of cucumbers during brining.

The version published in the Oil Mill Gazetteer includes an account of a treatment developed in a contract research project by the Institute of Textile Technology to make cotton fabrics more resistant to soiling and easier to clean.

30 MAZZENO, Laurence W., Jr.

TETRABENZOYL-α-D-GLUCOPYRANOSYL BROMIDE-CARBON TETRACHLORIDE ADDITION COMPOUND. Amer. Chem. Soc. Jour. 72(2): 1039. 1950.

The preparation of the addition compound of tetrabenzoyl-α-D-glucopyranosyl bromide-carbon tetrachloride is described and analytical data (calculated and found) are presented.

PRESS NOTICES, RESEARCH ACHIEVEMENT SHEETS

Chemical Test Reveals Presence of Honeydew on Lint Cotton. March 28. USDA 723-50.

Home Treatment Helps Cotton Goods Resist Dirt, Makes Them Easier to Wash. March 30. USDA 784-50.

New Dye Test of Fiber Maturity Aids Cotton Mills. Res. Achvt. Sheet 127(C,. (Processed.) January 1950.

PATENTS

REID, John David, and Daul, George C.

PREPARATION OF FIBERS FROM CARBOXYMETHYLCELLULOSE. U. S. Patent No. 2,495,767; Jan. 31, 1950.

Alkali-soluble fibers have been prepared by extruding solutions of a soluble salt of carboxymethylcellulose into precipitating solutions of copper sulfate, aluminum sulfate, lead acetate, stannous chloride, or mixtures of such solutions containing polyvalent metal ions which form insoluble salts with carboxymethylcellulose.

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PREVENTION OF DEGRADATION OF TEXTILE FIBERS BY ACIDS. U. S. Patent No. 2,493,031; Jan. 3, 1950.

The patent covers a process of impregnating textile materials, particularly cotton sewing thread for fertilizer bags, with a solution of triethanolamine to prevent degradation of the cellulose component of the material. Triethanolamine acts both as a humectant and as a neutralizing agent.

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